EMC TEST REPORT

Applicant	TP-LINK TECHNOLOGIES CO., LTD.
FCC ID	TE7C5V1
Brand	TP-LINK
Product	C5 FDD-LTE Smartphone
Model	TP701C
Report No.	RXA1601-0001EMC01R1
Issue Date	June 1, 2016

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC Code CFR47 Part15B (2015)**/ **ANSI C63.4 (2014)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Wei Liu

Reviewed by: Wei Liu

Guangchang Fan

Approved by: Guangchang Fan

TA Technology (Shanghai) Co., Ltd.

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Summary of measurement results

Number	Test Case	Clause in FCC Rules	Conclusion
1	Radiated Emission	15.109, ANSI C63.4-2014	PASS
2	Conducted Emission	15.107, ANSI C63.4-2014	PASS
Test Date: January 4, 2016 ~ January 13, 2016			

1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of TA technology (shanghai) co., Ltd).The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by CNAS or any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (recognition number is 428261)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-766**)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City:	Shanghai
Post code:	201201
Country:	P. R. China
Contact:	Xu Kai
Telephone:	+86-021-50791141/2/3
Fax:	+86-021-50791141/2/3-8000
Website:	http://www.ta-shanghai.com
E-mail:	xukai@ta-shanghai.com

2 General Description of Equipment under Test

2.1 Client Information

Applicant	TP-LINK TECHNOLOGIES CO., LTD.
Applicant address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China
Manufacturer	TP-LINK TECHNOLOGIES CO., LTD.
Manufacturer address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2.2 General information

EUT Description	
Device Type:	Portable Device
Product Name:	C5 FDD-LTE Smartphone
Model Number:	TP701C
HW Version:	AL815_MB_PCB_V2.0
SW Version:	H10S100D03B20151124R1001
IMEI:	SIM 1: 868983020009609 SIM 2: 868983020010961
Antenna Type:	Internal Antenna
Used Host Product:	Lenovo X61(SN : L3-D1224)
Test Mode:	Transfer Data Mode
EUT Accessory	
Adapter	Manufacturer: TP-LINK TECHNOLOGIES CO., LTD. Model: N050100-2B3 Input power: 100-240V AC 50/60Hz 0.3A Output power: 5V DC 1A
Battery	Manufacturer: DongGuan Amperex Technology Co., Ltd Model: NBL-45A2000 Power Rating: DC 3.8V, 2000mAh, Li-ion
USB Cable	104cm Cable, Shielded, Manufacturer: TP-LINK
Remark: The information of the EUT is declared by the manufacturer. Please refer to the specifications or user manual for details.	

2.3 Applied Standards

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

Test standards
FCC Code CFR47 Part15B (2015)
ANSI C63.4 (2014)

3 Test Case Results

3.1 Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
24°C~26°C	45%~50%	102.5kPa

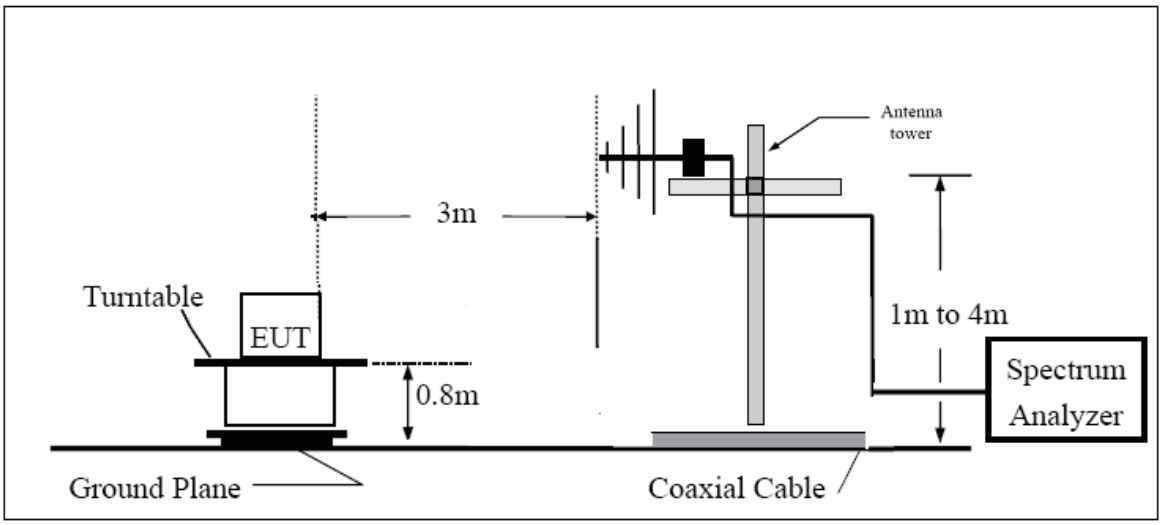
Methods of Measurement

The EUT is placed on a non-metallic table 0.8m above the horizontal metal reference ground plane. The distance between EUT and receive antenna should be 3 meters. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Sweep the whole frequency band through the range from 30MHz to the 5th harmonic of the carrier. During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum of radiated signal level.
The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing. During the test, the EUT is worked at maximum output power.
Set the spectrum analyzer in the following:
Below 1GHz:
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz:
(a) PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

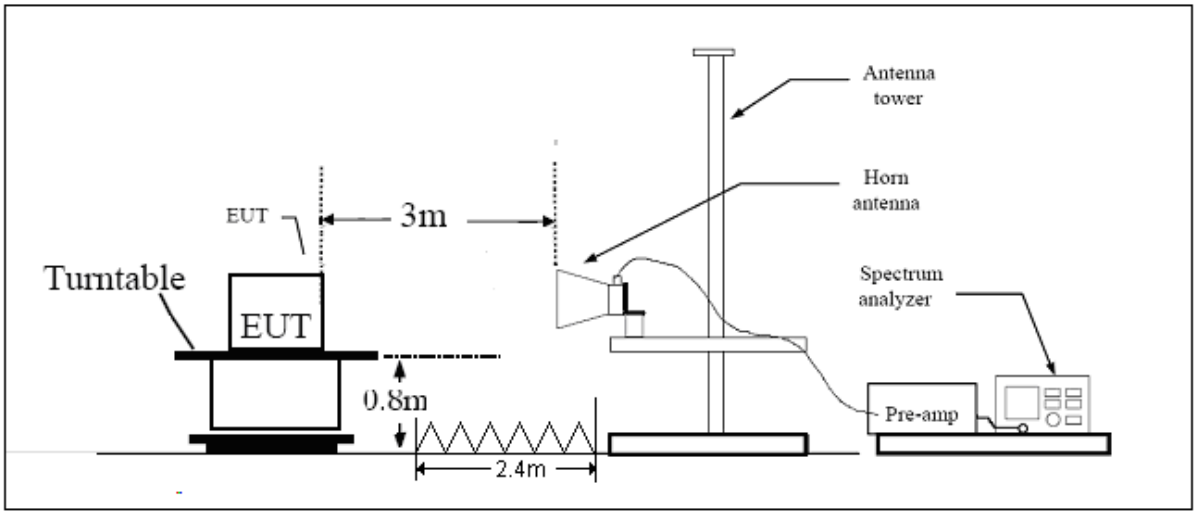
During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup

Below 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits

Frequency (MHz)	Field Strength (dBμV/m)	Detector
30 -88	40.0	Quasi-peak
88-216	43.5	Quasi-peak
216 – 960	46.0	Quasi-peak
960-1000	54.0	Quasi-peak
1000-5th harmonic of the highest frequency or 40GHz,which is lower	54 74	Average Peak

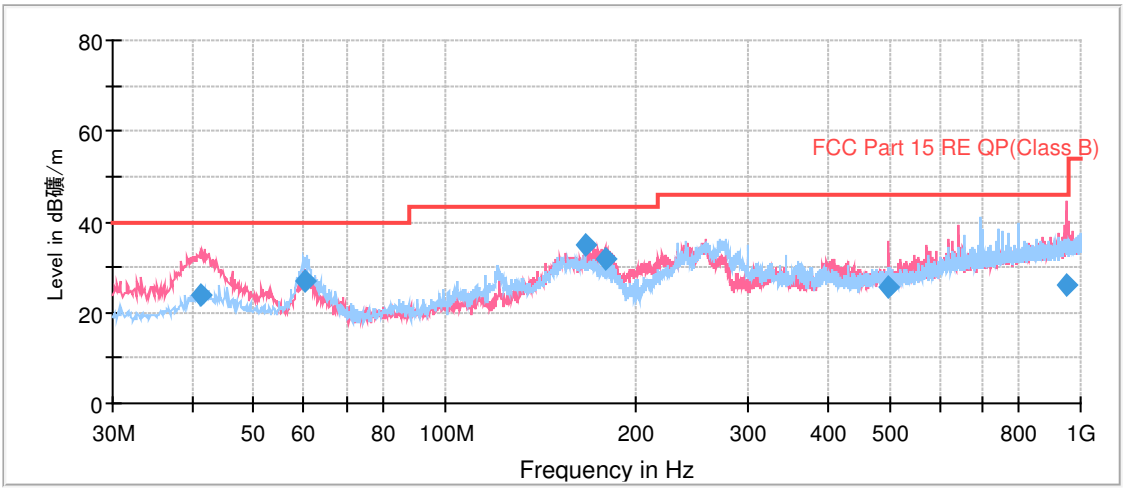
Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U= 3.92 dB.

Test Results

The messy code (dBμV/m) including in the following plots mean dBuv/m.
The following graphs display the maximum values of horizontal and vertical by software.
For above 1GHz, Blue trace uses the peak detection, Green trace uses the average detection.

FCC RE 0.03-1GHz QP Class B

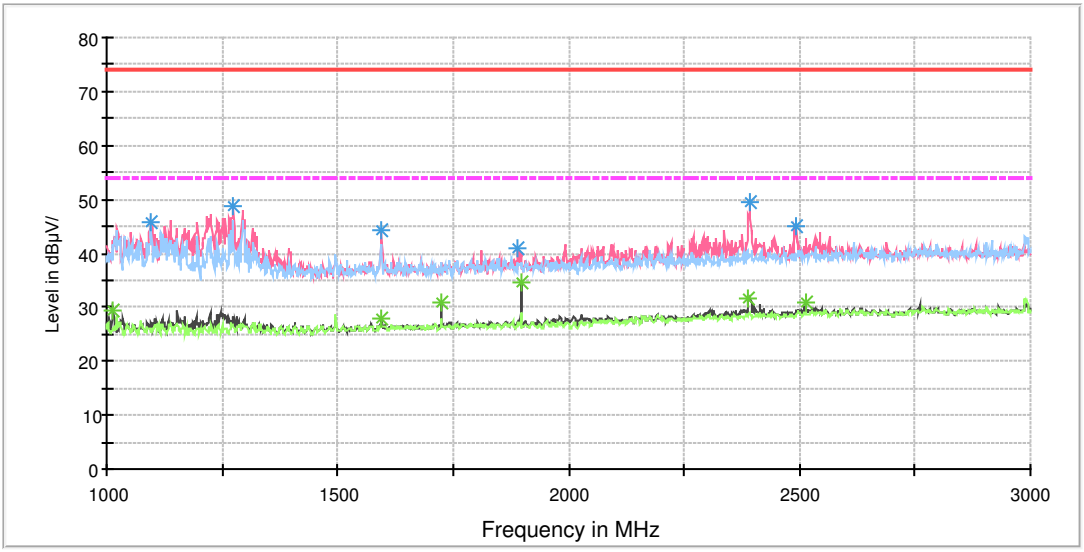


Radiated Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
41.322500	24.0	37.2	113.0	V	242.0	13.2	16.0	40.0
60.356250	26.8	39.1	225.0	H	0.0	12.3	13.2	40.0
166.281250	34.8	44.8	100.0	V	191.0	10.0	8.7	43.5
178.330000	32.0	42.8	100.0	V	203.0	10.8	11.5	43.5
497.863750	25.5	45.4	113.0	V	164.0	19.9	20.6	46.0
952.675000	26.3	52.3	100.0	V	16.0	26.0	19.7	46.0

Remark: 1. Quasi-Peak = Reading value + Correction factor
2. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)
3. Margin = Limit – Quasi-Peak

FCC RE 1G-3GHz PK+AV

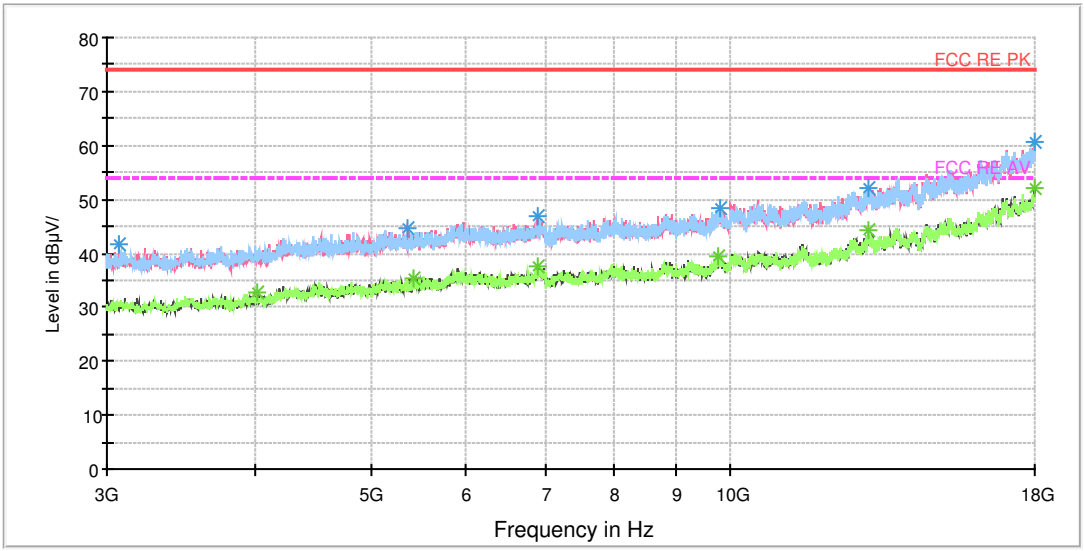


Radiated Emission from 1GHz to 3GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1097.500000	45.8	56.8	100.0	V	355.0	-11.0	28.2	74
1275.000000	48.6	58.9	100.0	V	0.0	-10.3	25.4	74
1595.000000	44.4	53.4	100.0	V	149.0	-9.0	29.6	74
1891.250000	41.0	49.1	100.0	V	359.0	-8.1	33.0	74
2392.500000	49.4	55.1	100.0	V	0.0	-5.7	24.6	74
2493.750000	44.9	49.9	100.0	V	0.0	-5.0	29.1	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1015.000000	29.4	40.7	100.0	V	104.0	-11.3	24.6	54
1593.750000	28.1	37.1	100.0	V	149.0	-9.0	25.9	54
1725.000000	30.7	39.3	100.0	V	213.0	-8.6	23.3	54
1897.500000	34.7	42.8	100.0	V	0.0	-8.1	19.3	54
2390.000000	31.8	37.5	100.0	V	20.0	-5.7	22.2	54
2513.750000	30.9	35.9	100.0	V	345.0	-5.0	23.1	54

RE 3-18GHz PK+AV

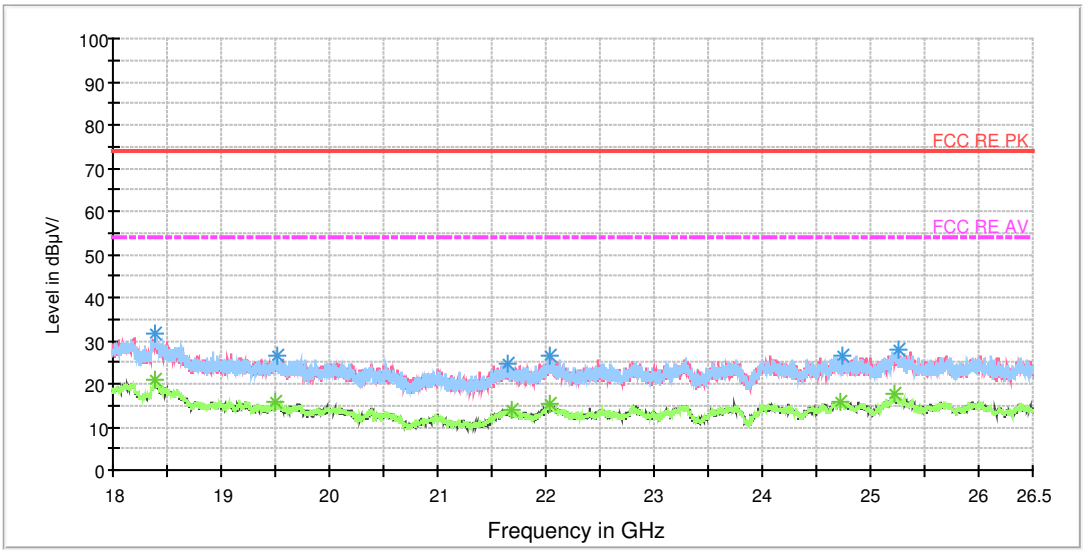


Radiated Emission from 3GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
3071.250000	41.6	43.2	101.0	V	326.0	-1.6	32.4	74
5370.000000	44.7	48.4	101.0	V	313.0	3.7	29.3	74
6888.750000	46.8	53.7	101.0	V	30.0	6.9	27.2	74
9815.625000	48.3	60.4	101.0	V	0.0	12.1	25.7	74
13068.750000	52.2	68.4	101.0	H	26.0	16.2	21.8	74
18000.000000	60.6	86.0	101.0	V	313.0	25.4	13.4	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
4014.375000	32.6	33.1	101.0	H	0.0	0.5	21.4	54
5433.750000	35.4	39.2	101.0	H	0.0	3.8	18.6	54
6888.750000	37.4	44.3	101.0	V	30.0	6.9	16.6	54
9774.375000	39.5	51.5	101.0	H	113.0	12.0	14.5	54
13065.000000	44.3	60.5	101.0	H	268.0	16.2	9.7	54
17996.250000	52.1	77.5	101.0	V	177.0	25.4	1.9	54

RE 18-26.5GHz PK+AV



Radiated Emission from 18GHz to 26.5GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18391.000000	31.4	36.3	H	0.0	-4.9	42.6	74
19511.937500	26.5	34.0	H	34.5	-7.5	47.5	74
21652.875000	24.8	34.0	H	90	-9.2	49.2	74
22030.062500	26.5	34.5	V	90	-8.0	47.5	74
24740.500000	26.6	33.1	V	5	-6.5	47.4	74
25263.250000	27.8	34.7	V	30	-6.9	46.2	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
18385.687500	21.0	25.8	H	0.0	-4.8	33.0	54
19501.312500	15.8	23.3	H	35	-7.5	38.2	54
21693.250000	14.2	23.5	H	90	-9.3	39.8	54
22046.000000	15.4	23.4	H	184	-8.0	38.6	54
24721.375000	16.0	22.3	V	13	-6.3	38.0	54
25225.000000	17.6	23.5	V	46	-5.9	36.4	54

3.2 Conducted Emission

Ambient condition

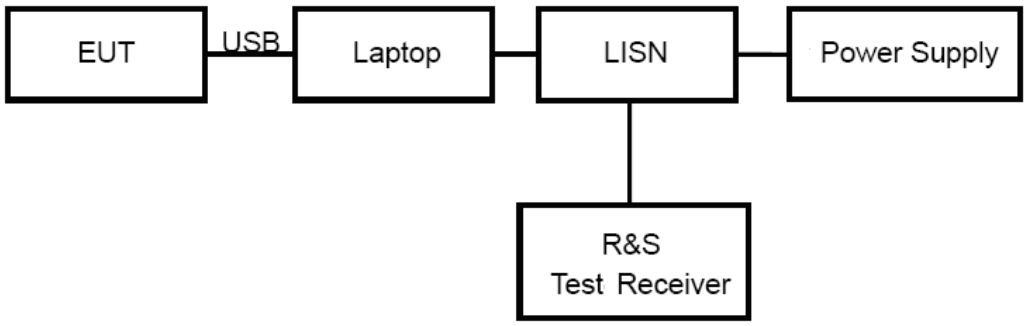
Temperature	Relative humidity	Pressure
24°C ~26°C	50%~55%	102.5kPa

Methods of Measurement

The EUT is placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.4-2014. Connect the AC power line of the EUT to the L.I.S.N. Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9 kHz, VBW is set to 30kHz. The measurement result should include both L line and N line.

During the test, EUT is connected to a laptop via a USB cable in the case of Transfer Data mode. The EUT is used as the peripheral equipment of the PC. The data is transferred from EUT to PC; PC is connected to server via a long LAN cable.

Test Setup



Note: Power Supply is AC Power source and it is used to change the voltage 120V/60Hz.

Limits

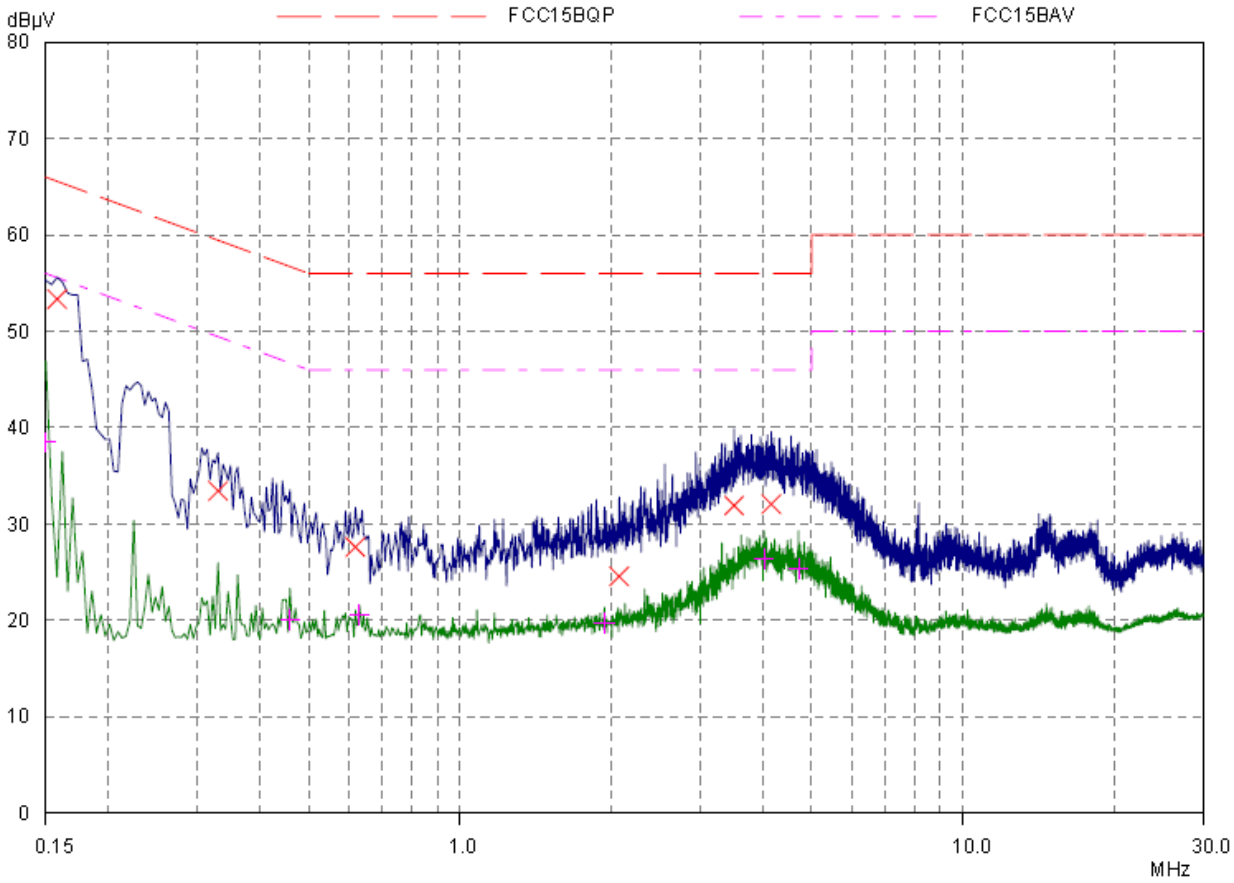
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 1.96. U= 2.69 dB.

Test Results

Following plots, Blue trace uses the peak detection; Green trace uses the average detection.



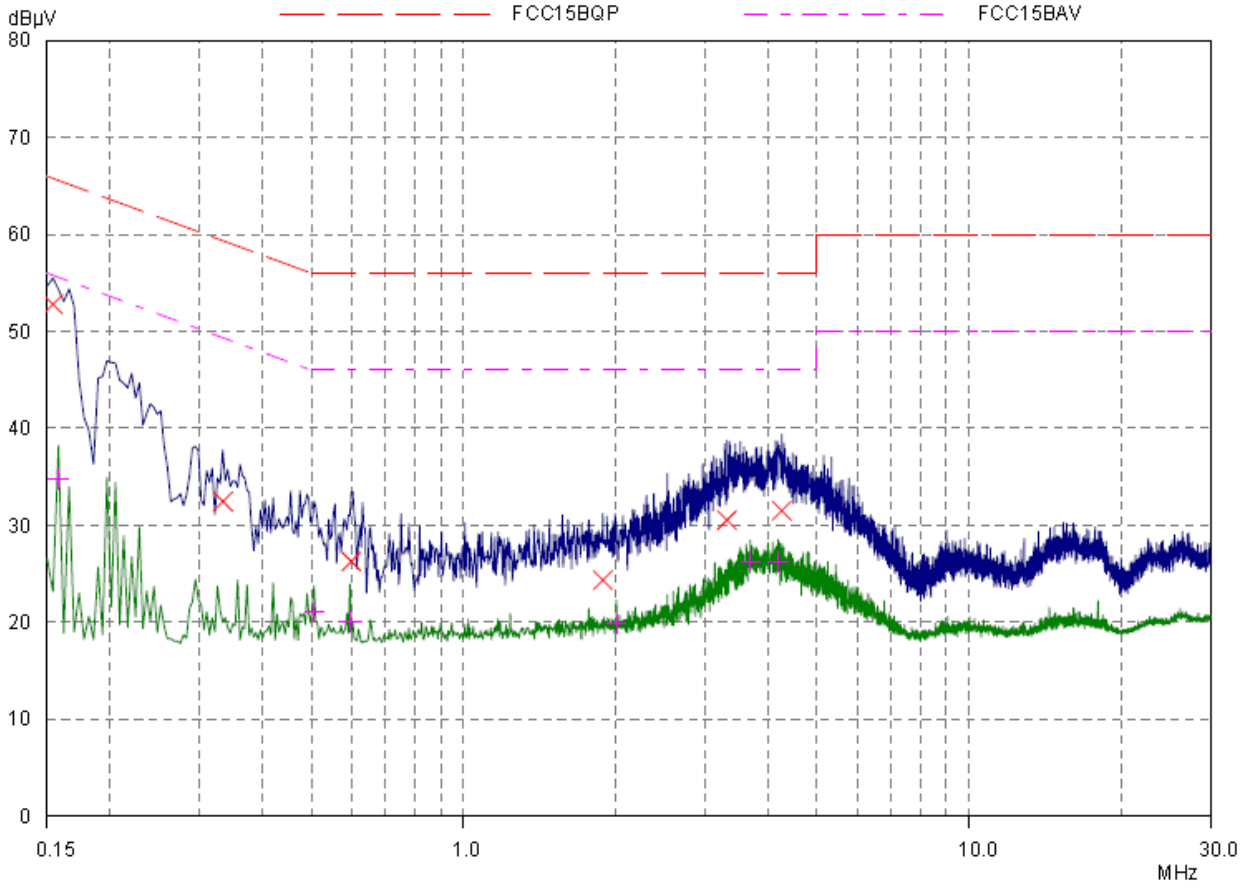
Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.15781	53.34	65.58	12.24	L1	gnd
0.32968	33.43	59.46	26.03	L1	gnd
0.61875	27.61	56.00	28.39	L1	gnd
2.07187	24.58	56.00	31.42	L1	gnd
3.50546	31.91	56.00	24.09	L1	gnd
4.1578	32.08	56.00	23.92	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.15	38.47	56.00	17.53	L1	gnd
0.45859	20.11	46.72	26.61	L1	gnd
0.63046	20.60	46.00	25.40	L1	gnd
1.93515	19.76	46.00	26.24	L1	gnd
4.02109	26.42	46.00	19.58	L1	gnd
4.70859	25.37	46.00	20.63	L1	gnd

L line

Conducted Emission from 150 KHz to 30 MHz



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.1539	52.80	65.79	12.99	N	gnd
0.33359	32.47	59.36	26.89	N	gnd
0.59921	26.28	56.00	29.72	N	gnd
1.88437	24.35	56.00	31.65	N	gnd
3.31796	30.54	56.00	25.46	N	gnd
4.25937	31.53	56.00	24.47	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.15781	34.83	55.58	20.75	N	gnd
0.50546	21.02	46.00	24.98	N	gnd
0.59531	20.10	46.00	25.90	N	gnd
2.00545	19.83	46.00	26.17	N	gnd
3.68906	26.28	46.00	19.72	N	gnd
4.18905	26.23	46.00	19.77	N	gnd

N line
Conducted Emission from 150 KHz to 30 MHz

4 Main Test Equipment

Name	Type	Manufacturer	Serial Number	Last Cal.	Cal. Due Date
EMI Test Receiver	ESCI	R&S	100948	2015-05-22	2016-05-21
Trilog Antenna	VULB 9163	SCHWARZBECK	9163-201	2014-12-06	2017-12-05
Signal Analyzer	FSV30	R&S	100815	2015-12-17	2016-12-16
Horn Antenna	HF907	R&S	100126	2014-12-06	2017-12-05
Horn Antenna	3160-09	ETS-Lindgren	00102643	2015-01-30	2018-01-29
EMI Test Receiver	ESCS30	R&S	100138	2015-12-17	2016-12-16
LISN	ENV216	R&S	101171	2013-12-18	2016-12-17

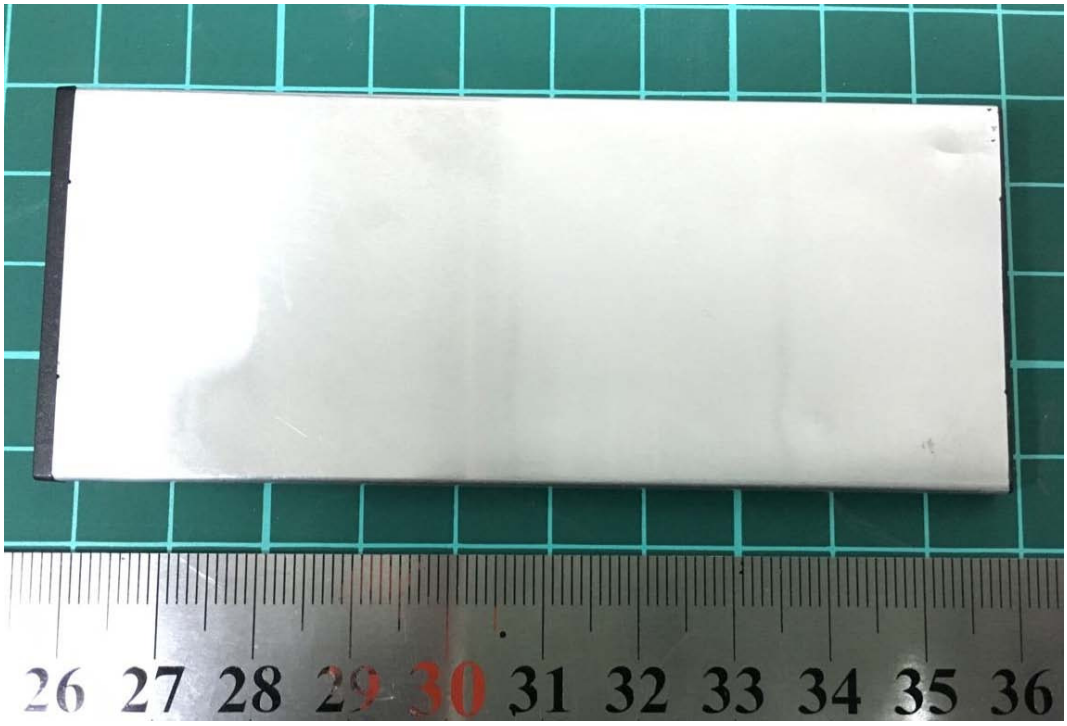
ANNEX A: The EUT Appearance and Test Configuration

A.1 EUT Appearance

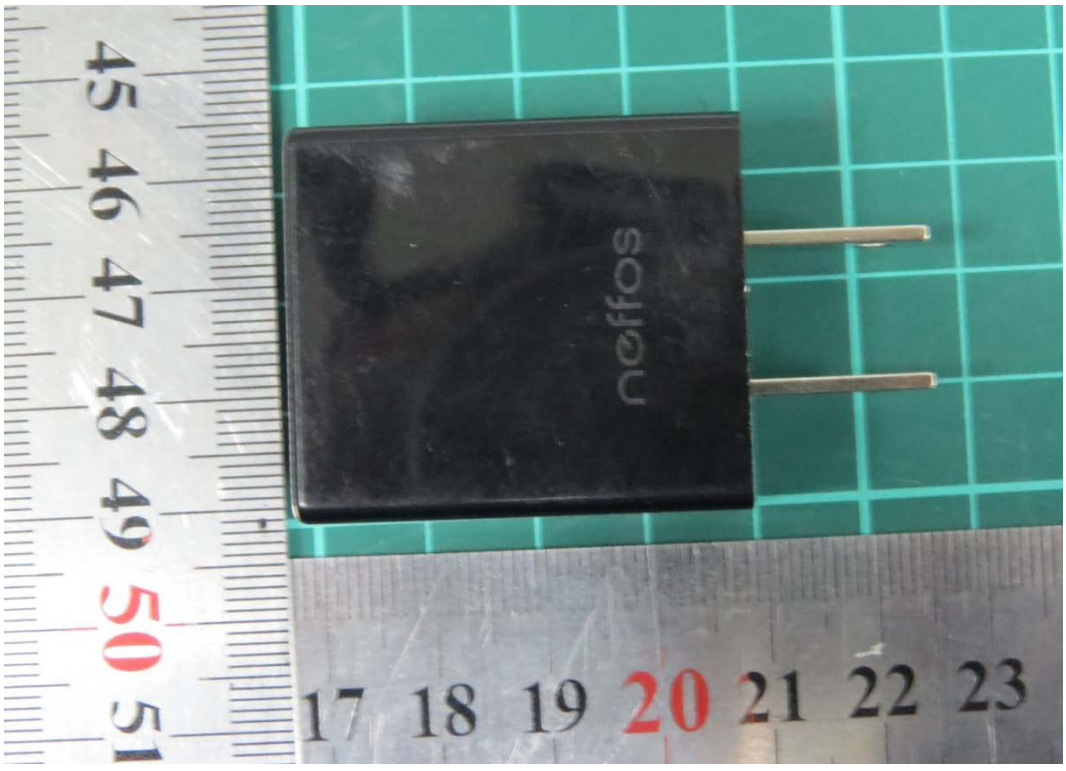
Front Side

Back Side

a: EUT



b: Battery

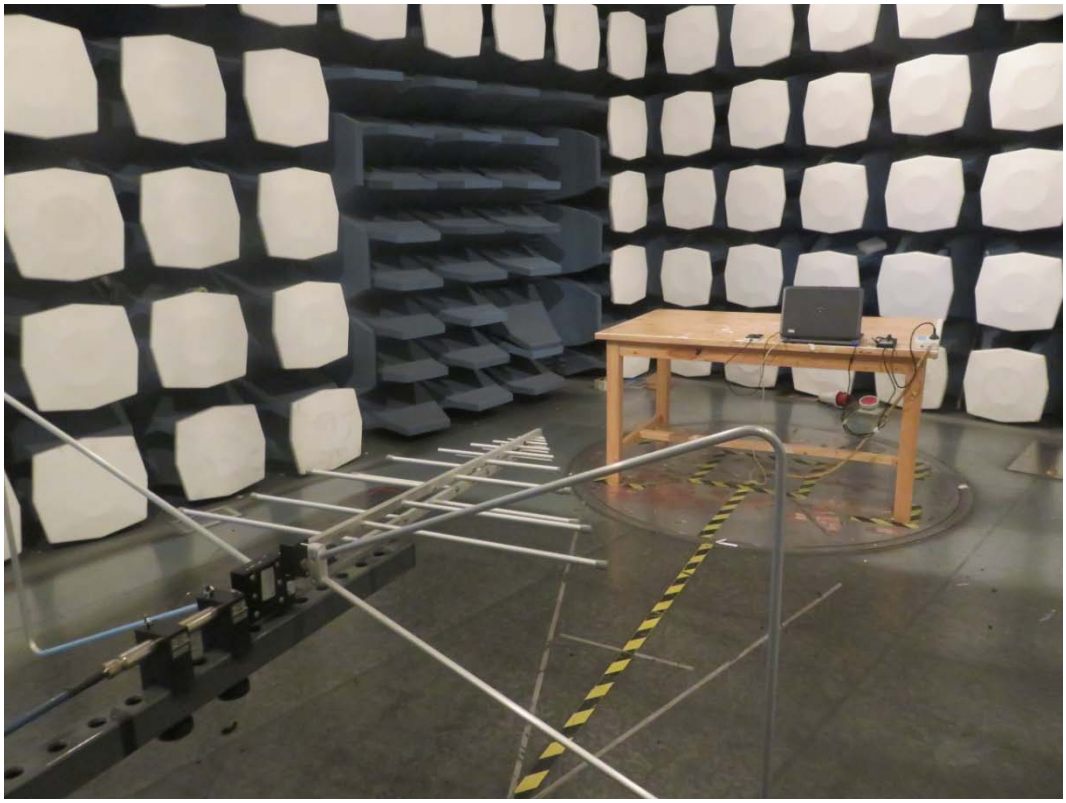


c: Adapter

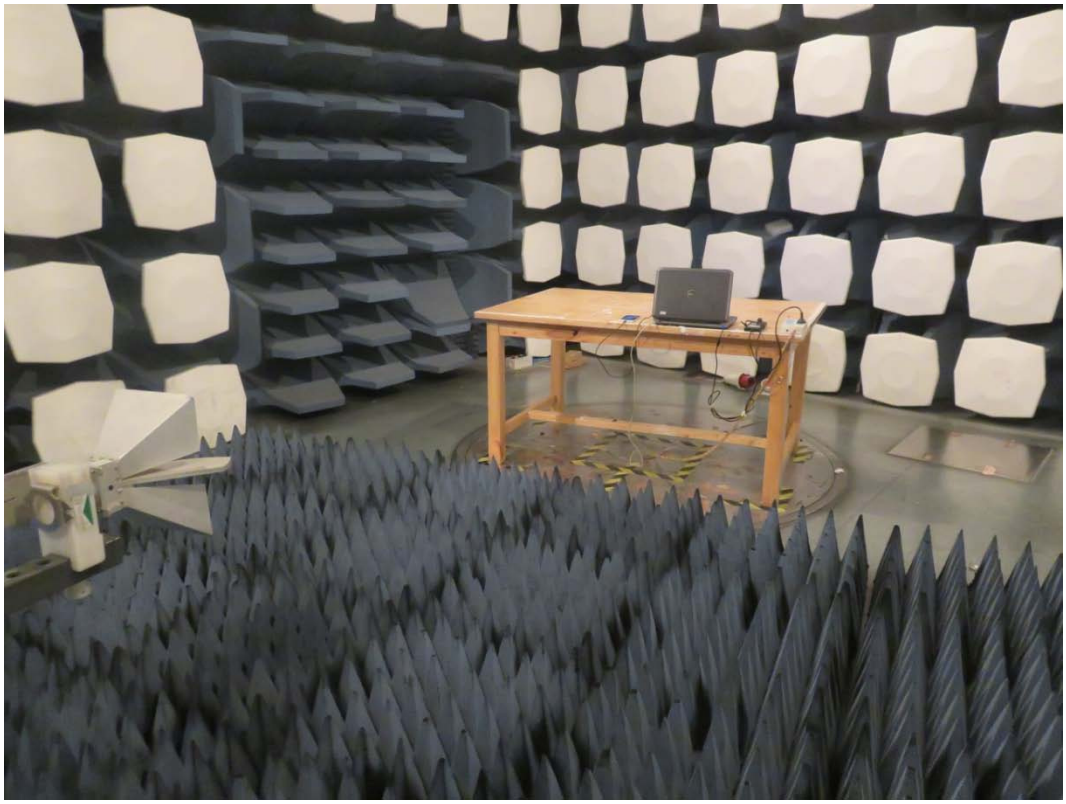
d : USB Cable

Picture 1 EUT

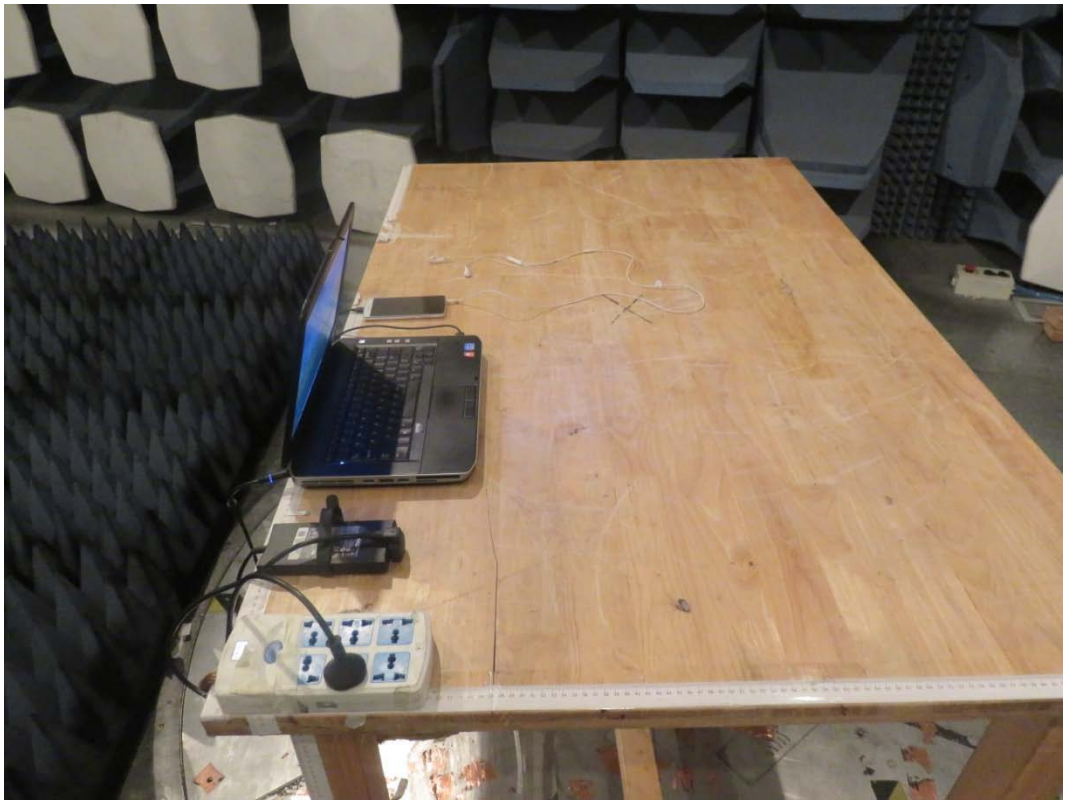
A.2 Test Setup



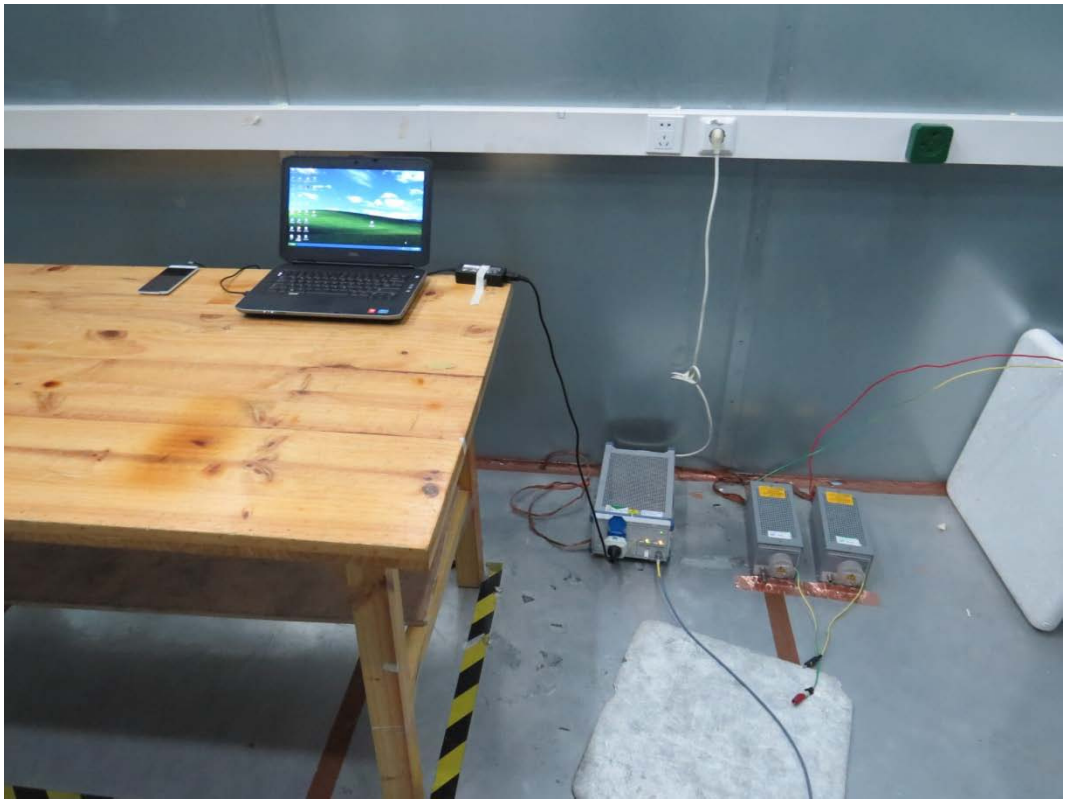
a: Below 1GHz



b: Above 1GHz



Picture 2 Radiated Emission Test Setup



Picture 3 Conducted Emission Test Setup